

**DISCUSSION OF THE AMENDMENTS**

Claim 1 is currently amended.

Claim 2 is cancelled without prejudice or disclaimer.

Claims 3 -20 were previously presented.

Claims 21 and 22 are new.

Upon entry of the amendment claims 1 and 3-22 will be active.

The amendment to claim 1 is supported on page 3, lines 30-34 of the specification and by original claim 2.

New claim 21 is supported by claim 1 as previously presented and on page 3, lines 30-34 of the specification.

New claim 22 is supported by claims 1 and 2 as previously presented.

No new matter has been added.

### **REMARKS**

The Office rejected claims 1-6 and 9-17 under 35 U.S.C. §103(a) over the combination of Motani '542 (U.S. Patent No. 4,990,542), Motani '033 (U.S. Patent No. 5,317,033), BASF EP (EP 0915127) and BASF WO (WO 98/51735). In addition, claims 7-8 and 18-20 were rejected under 35 U.S.C. §103(a) over the combination of Motani '542, Motani '033, BASF EP, BASF WO and Wesselmann (U.S. Patent No. 4,585,825).

The present disclosure involves a process for producing foam beads from thermoplastic polymers. The process includes addition of a blowing agent to a thermoplastic melt then cooling and extrusion, through a die, of the polymer melt containing blowing agent and then cutting the polymer melt containing the blowing agent downstream of the die at reduced pressure with foaming to give foam beads with a bulk density below 30kg/m<sup>3</sup>. The process also involves using a blowing agent in which water and a solubilizer are present where the solubilizer contains an aliphatic alcohol, ketone, either or ester. Applicants submit that the combination of the cited references do not teach or suggest all the recitations of the claimed process, and, therefore, the claimed process would not have been rendered unpatentable over the combination of the cited references. In addition, Applicants submit that the modifications to the cited references would have rendered the references unsuitable for their intended purpose, and therefore, the process would not have been obvious over the cited references.

The cited Motani references involve extruded synthetic foam sheets. The processes described in Motani are concerned with forming an anisotropic foam sheet with cell sizes that give both a desired thickness and high flexural strength (see column 1 and Table 1 in U.S. Patent No. 5,317,033). The flexural strength of the foam sheet comes in part from a thin polymer skin on both sides of the sheet formed during the sheeting process. As the Office has noted on page 2 of the Office Action, these processes give foam sheets or panels not foam beads. Further, Applicants note that the Motani references do not teach or suggest foam beads with a bulk density below 30 kg/m<sup>3</sup>.

With regard to the BASF EP reference, Applicants note that a translation was attached to this reference in the IDS filed on February 28, 2005. For the Office's convenience this reference and translation are enclosed with this paper.

The cited BASF references involve expandable styrene polymer particles (EPS). The EPS materials are formed under pressure and contain blowing agent (pentane) and are utilized as intermediates. Foam particles are subsequently produced by pre-foaming the EPS materials with steam and subsequently welding together the foamed particles to give moldings (see U.S. Patent No. 6,340,713 column 1, lines 7-13 and column 5, lines 9-15, counterpart to WO 98/51735). Accordingly, the process for forming the foamed particle in the BASF references is different than the claimed process for producing foam beads. Accordingly, Applicants submit that the process for forming beads in the BASF references is not combinable with the process described in the Motani references since the Motani references form a foamed product during extrusion and the BASF references do not form a foamed product during the extrusion process. Applicants also note that the BASF references utilize pentane as a blowing agent and do not teach using water and a solubilizer as a blowing agent. In addition, the BASF references do not teach or suggest foam beads with a bulk density below 30 kg/m<sup>3</sup>.

Further Applicants submit that there would be no motivation to combine the Motani references with the BASF references. Both process lead to different products with different end uses. Specifically, the cell structures and mechanical properties of the sheets formed by these different processes are distinct owing to the specific end use. Even if these references were combined a pelletizing step involving cutting the polymer downstream of the die at reduced pressure with foaming using a blowing agent containing water and solubilizer would have to be added which is out of step with the disclosed processes. Therefore, the proposed modifications require additional modifications of the cited process steps which are not taught or suggested by the cited references.

Overall, the combination of the references do not teach or suggest a process giving foam beads with a bulk density below 30kg/m<sup>3</sup>. Because the combination of the Motani and BASF

references do not teach or suggest all the recitations of the claimed process, the claimed process would not have been obvious over the combination of the cited references.

Furthermore, Applicants submit that the proposed modifications to Motani would render Motani unsatisfactory for its intended purpose. (See MPEP 2143.01(v)) Specifically, Motani involves forming foamed sheets for insulation. Cutting these foamed sheets would render the process unsuitable for its intended purpose since sheets are required. Motani requires the formation of foam sheets with selected flexural strength and bending at break properties (see Table 1 of U.S. Patent No. 5,317,033). Because the proposed modification renders the process unsatisfactory for its intended purpose, the claimed process would not have been obvious over the cited references.

In summary, the combination of the cited Motani and BASF references do not teach or suggest all the recitations of the claimed process. In addition, the proposed modification to the Motani references would render the references unsuitable for their intended purpose. Accordingly, the claimed process would not have been rendered unpatentable over the Motani and BASF references, and therefore, Applicants respectfully request that the Office withdraw the rejection of claim 1, 3-6 and 9-17 under 35 U.S.C. §103(a).

With regard to the rejection of claims 7, 8 and 18-20, Applicants submit that Wesselman does not make up for the deficiencies of the Motani and BASF references as discussed above. Applicants note that Wesselman does not relate to thermoplastic polymer foams and does not give any or suggest as to how the molecular weight distribution of the polymer affects the foaming process or any foam characteristics. Accordingly, Applicants respectfully request that the Office withdraw the rejection of claims 7, 8 and 18-20 under 35 U.S.C. §103(a).

In view of the above remarks, Applicants believes the pending application is in condition for allowance. Favorable reconsideration is respectfully requested.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 12810-00034-US from which the undersigned is authorized to draw.

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Respectfully submitted,  
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